

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for forming a tissue product comprising:
providing a liquid furnish of cellulosic fibers;
forming a multi-layered wet web from said liquid furnish of cellulosic fibers;
applying a debonder to said furnish, said wet web, or combinations thereof;
applying at least one latex having a glass transition temperature less than about 30°C to said liquid furnish, said wet web, or combinations thereof, said latex being applied in an amount less than about 60 pounds per ton of the dry weight of said cellulosic fibers; and
drying said wet web, wherein greater than about 60% of said latex is retained on said cellulosic fibers and wherein at least one outer layer of said dried web contains said latex-treated cellulosic fibers.
2. (Original) A method as defined in claim 1, wherein the glass transition temperature of said latex is greater than about -25°C.
3. (Original) A method as defined in claim 1, wherein the glass transition temperature of said latex is between about -15°C to about 15°C.
4. (Original) A method as defined in claim 1, wherein the glass transition temperature of said latex is between about -10°C to about 0°C.
5. (Original) A method as defined in claim 1, wherein said latex is selected from the group consisting of styrene-butadiene copolymers, polyvinyl acetate homopolymers, vinyl-acetate ethylene copolymers, vinyl-acetate acrylic copolymers, ethylene-vinyl chloride copolymers, ethylene-vinyl chloride-vinyl acetate terpolymers, acrylic polyvinyl chloride polymers, acrylic polymers, and nitrile polymers.
6. (Original) A method as defined in claim 1, wherein said latex is applied in an

amount of between about 1 to about 40 pounds per ton of the dry weight of said cellulosic fibers.

7. (Original) A method as defined in claim 1, wherein said latex is applied in an amount of between about 1 to about 20 pounds per ton of the dry weight of said cellulosic fibers.

8. (Original) A method as defined in claim 1, wherein said debonder is applied prior to said latex.

9. (Original) A method as defined in claim 1, further comprising applying a wet strength agent to said furnish, said wet web, or combinations thereof;

10. (Original) A method as defined in claim 9, wherein said wet strength agent is applied prior to said latex.

11. (Original) A method as defined in claim 9, wherein said wet strength agent includes a temporary wet strength agent.

12. (Original) A method as defined in claim 11, wherein said temporary wet strength agent comprises a cationic polyacrylamide polymer.

13. (Original) A method as defined in claim 11, wherein said temporary wet strength agent is applied in an amount between about 1 to about 60 pounds per ton of the dry weight of said cellulosic fibers.

14. (Original) A method as defined in claim 9, wherein said wet strength agent includes a permanent wet strength agent.

15. (Original) A method as defined in claim 14, wherein said permanent wet strength agent comprises a cationic polyamide polymer.

16. (Original) A method as defined in claim 14, wherein said permanent wet strength agent is applied in an amount between about 1 to about 20 pounds per ton of the dry weight of said cellulosic fibers.

17. (Original) A method as defined in claim 1, wherein said debonder includes an imidazoline quaternary compound.

18. (Original) A method as defined in claim 1, wherein said debonder includes an ester-functional quaternary ammonium compound.

19. (Original) A method as defined in claim 1, wherein said debonder is applied in an amount between about 1 to about 30 pounds per ton of the dry weight of said cellulosic fibers.

20. (Cancelled)

21. (Original) A method as defined in claim 1, wherein between about 75% to about 90% of said latex is retained on said cellulosic fibers.

22. (Original) A method as defined in claim 1, wherein said latex is sprayed onto said wet web.

23. (Currently amended) A method for forming a tissue product comprising:
providing a liquid furnish of cellulosic fibers;
forming a multi-layered wet web from said liquid furnish of cellulosic fibers;
applying a debonder to said furnish, said wet web, or combinations thereof, in an amount between about 1 to about 30 pounds per ton of said cellulosic fibers;
applying a wet strength agent to said furnish, said wet web, or combinations thereof, said wet strength agent being selected from the group consisting of temporary wet strength agents, permanent wet strength agents, and combinations thereof;
applying at least one latex to said furnish, said wet web, or combinations thereof in an amount between about 1 to about 40 pounds per ton of the dry weight of said cellulosic fibers, said latex having a glass transition temperature less than about 30°C and greater than about -25°C; and

drying said wet web, wherein greater than about 60% of said latex is retained on said cellulosic fibers and wherein at least one outer layer of said dried web contains said latex-treated cellulosic fibers.

24. (Original) A method as defined in claim 23, wherein the glass transition temperature of said latex is between about -15°C to about 15°C.

25. (Original) A method as defined in claim 23, wherein the glass transition temperature of said latex is between about -10°C to about 0°C.

26. (Original) A method as defined in claim 23, wherein said latex is selected from the group consisting of styrene-butadiene copolymers, polyvinyl acetate homopolymers, vinyl-acetate ethylene copolymers, vinyl-acetate acrylic copolymers, ethylene-vinyl chloride copolymers, ethylene-vinyl chloride-vinyl acetate terpolymers, acrylic polyvinyl chloride polymers, acrylic polymers, and nitrile polymers.

27. (Original) A method as defined in claim 23, wherein said debonder is applied prior to said latex.

28. (Original) A method as defined in claim 23, wherein said wet strength agent is applied prior to said latex.

29. (Cancelled)

30. (Original) A method as defined in claim 23, wherein between about 75% to about 90% of said latex is retained on said cellulosic fibers.

31. (Original) A method as defined in claim 23, wherein said latex is sprayed onto said wet web.

32. (Original) A method as defined in claim 23, wherein said latex is applied in an amount between about 1 to about 40 pounds per ton of the dry weight of said cellulosic fibers.

33. (Original) A tissue product having a basis weight less than about 80 grams per square meter, said tissue product comprising a multi-layered paper web having at least one outer layer that defines an outer surface of the tissue product, said outer layer being formed from cellulosic fibers, said cellulosic fibers being applied with a debonder, a wet strength agent, and at least one latex having a glass transition temperature less than about 30°C and greater than about -25°C, wherein greater than about 60% of said applied latex is retained on said cellulosic fibers of said outer layer, and wherein said latex comprising comprises less than about 3% of the dry weight of said outer layer.

34. (Original) A tissue product as defined in claim 33, wherein said latex comprises between about 0.05% to about 2% of the dry weight of said outer layer.

35. (Original) A tissue product as defined in claim 33, wherein said latex comprises between about 0.05% to about 1% of the dry weight of said outer layer.

36. (Original) A tissue product as defined in claim 33, wherein the glass transition temperature of said latex is between about -15°C to about 15°C.

37. (Original) A tissue product as defined in claim 33, wherein the glass transition temperature of said latex is between about -10°C to about 0°C.

38. (Original) A tissue product as defined in claim 33, wherein the remaining layers of said multi-layered paper web are substantially free of said latex.

39. (Original) A facial tissue as defined in claim 33.

40. (Original) A bath tissue as defined in claim 33.

41. (Original) A bath tissue as defined in claim 40, wherein said wet strength agent consists essentially of a temporary wet strength agent.

42. (Original) A paper towel as defined in claim 33.

43. (Currently amended) A tissue product having a basis weight less than about 80 grams per square meter, said tissue product comprising a multi-layered paper web having at least one outer layer that defines an outer surface of the tissue product, said outer layer being formed from cellulosic fibers, said cellulosic fibers being applied with a debonder, a wet strength agent, and at least one latex having a glass transition temperature less than about 30°C and greater than about -25°C, wherein greater than about 60% of said applied latex is retained on said cellulosic fibers of said outer layer, and wherein said latex ~~comprising~~ comprises less than about 3% of the tissue product.

44. (Original) A tissue product as defined in claim 43, wherein said latex comprises between about 0.05% to about 2% of the dry weight of said outer layer.

45. (Original) A tissue product as defined in claim 43, wherein said latex comprises between about 0.05% to about 1% of the dry weight of said outer layer.

46. (Original) A tissue product as defined in claim 43, wherein the glass transition temperature of said latex is between about -15°C to about 15°C.

47. (Original) A tissue product as defined in claim 43, wherein the glass transition temperature of said latex is between about -10°C to about 0°C.

REMARKS

Favorable reconsideration and allowance of the present application in view of the foregoing amendments and the following remarks are respectfully requested.

At paragraph 3, the Office Action objected to the drawings filed with the application on December 3, 2001 and stated that new corrected drawings are required for the present application. Sheets 1-4 of Formal Drawings are submitted herewith. Applicants respectfully note that these Formal Drawings were previously submitted to the Patent Office on August 6, 2002. However, the present Re-submission of Formal Drawings Sheets 1-4 should overcome the objection to the drawings.

Claims 1-19, 21-28, and 30-47 remain in this application. Claims 1, 23, 33, and 43 have been amended in this paper, while claims 20 and 29 have been cancelled.

The claims of the present application are generally directed to a method for forming a tissue product wherein a liquid furnish of cellulosic fibers is formed into a multi-layered wet web and wherein a debonder and at least one latex are applied to the furnish, the wet web, or combinations thereof. The latex used herein has a glass transition temperature of less than about 30°C and may be applied, for example, in an amount less than about 60 pounds per ton of the dry weight of the cellulosic fibers. After application of the debonder and the latex to the furnish, the wet web, or combinations thereof, the wet web is dried so that at least one outer layer of the dried web contains the latex-treated cellulosic fibers. The claims as amended herein require that greater than about 60% of the latex is retained on the cellulosic fibers of the web.

Claims 1-3, 5-24, 26-36, and 38-46, which include independent claims 1, 23, 33, and 43, were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under Section 103(a) as being obvious in view of either U.S. Patent No. 5,427,696 or 5,510,000 to Phan et al. and U.S. Patent No. 3,844,880 to Meisel et al. Phan et al. '696 is directed to a biodegradable chemical softening composition for treating fibrous cellulose materials, where the composition specifically comprises a

mixture of (1) a quaternized ester-amine compound and (2) a polyhydroxy compound. Phan et al. '696 focuses its disclosure on methods of synthesizing or "making up" such a biodegradable chemical softening composition. (See, for example, col. 7, line 45 – col. 8, line 29; cols. 9 and 10; and Examples 1-7). In Phan et al. '696, an anionic styrene-butadiene latex is only disclosed as an "optional ingredient," specifically as a possible water-soluble wet strength resin for use in the papermaking processes discussed therein. (See col. 17, lines 33-38).

Likewise, Phan et al. '000 is directed to paper products containing a vegetable oil-based chemical softening composition for use in papermaking, and anionic styrene-butadiene latexes are again disclosed only as *optional* water-soluble wet strength resins to be used in conjunction with the vegetable oil-based softening composition. (See, for example, Abstract and col. 14, lines 56-60).

Further, Meisel et al., which was incorporated by reference into the cited Phan et al. '696 and '000 patents, was also incorporated by reference into Applicants' present specification at page 7. Meisel et al. is generally directed to a method of producing cellulosic sheet materials from a cellulosic fibrous slurry to which there is added sequentially a cationic surface active agent and an anionic or nonionic resin, which resin further requires a deposition aid. Meisel et al. does not contemplate the formation of a multi-layered wet web. Applicants used Meisel et al. in their present specification to describe other examples of suitable latexes that may be used in accordance with the present invention besides those listed, for example, at page 6 of the specification.

Applicants respectfully submit that Phan et al. '696 and '000 and Meisel et al., alone or in combination, do not disclose or in any way teach the methods and tissue products recited in amended claims 1, 23, 33, and 43, wherein greater than about 60% of the latex applied to the cellulosic fibers or web is retained on those fibers. As described in Applicants' specification, latex retention percentages can be controlled, for example, by selectively altering one or more variables, such as the sequence of

application of the latex and reactive compositions, the type of latex, the type of reactive compositions, the amount of latex and reactive compositions applied, and so forth. (Appl. at pages 21, lines 6-15).

At page 20, lines 15-20, Applicants' specification points out that controlling the latex retention percentages to make such percentages higher leads to better inhibition of the production of slough from the web. Furthermore, Applicants' specification explains in detail that the higher percentages of latex retention obtained in the methods of the present invention provide for lower total levels of latex to be used than if the retention percentage was relatively low:

By controlling the retention % of the latex, the strength and stiffness imparted to the tissue product can be appropriately balanced as desired. Moreover, relatively high retention percentages can allow a lower total level of latex to be used than if the retention percentage was relatively low. Accordingly, because a lower amount of latex is required, the present invention can provide a substantial cost reduction and enhanced efficiency to the papermaking process. Moreover, the resulting tissue product can be strong and produce a relatively low amount of lint and slough, while also maintaining the flexibility and softness desired for many end uses of the tissue product.

(Appl. at pages 21-22). Retaining the latex on the cellulosic fibers leads to the latex forming a flexible bond with the cellulosic fibers such that a resulting web is flexible and strong, while also producing low amounts of lint and slough. (Appl. at page 4). And high retention rates (such as the retention rates obtained in the methods of the present invention) of *nonionic* or *anionic* latexes on *anionically-charged* cellulosic fibers may be unexpected. (See Appl. at page 1).

In short, Applicants respectfully submit that the Phan et al. '696 and '000 references, alone or in conjunction with Meisel et al., do not disclose or suggest the synergistic effect of the claimed methods of independent claims 1 and 23 or the claimed tissue products of independent claims 33 and 43, wherein the combination of applying a debonder and at least one very specific latex (a latex having a glass

transition temperature of less than about 30°C) to a liquid furnish of cellulosic fibers, a wet web made from such cellulosic fibers, or combinations thereof, results in tissue products having reduced lint and slough and tissue products wherein greater than 60% of the latex applied to the furnish or web is retained on the cellulosic fibers of the web.

Various dependent claims were rejected under either Section 102(b) or 103(a) as being unpatentable over Phan et al. '696 or '000 and Meisel et al. Additionally, dependent claims 4, 25 and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Phan et al. '696 or '000 and Meisel et al. (discussed in detail above) in view of U.S. Patent No. 6,129,815 to Larson et al. or U.S. Patent No. 5,851,352 to Vinson et al. Applicants respectfully submit, however, that at least for the reasons indicated above relating to corresponding independent claims 1, 23, 33, and 43, the dependent claims patentably define over the references cited in the Office Action. However, Applicant also notes that the patentability of the dependent claims does not necessarily hinge on the patentability of independent claims 1, 23, 33, and 43. In particular, it is believed that some or all of these dependent claims may possess features that are independently patentable, regardless of the patentability of claims 1, 23, 33, and 43.

Appl. No. 10/005,882
Amdt. Dated October 1, 2003
Reply to Office Action of July 1, 2003

In summary, Applicants respectfully submit that the present claims patentably define over all of the prior art of record for at least the reasons set forth above. As such, it is believed that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this Amendment, Examiner Chin is invited and encouraged to telephone the undersigned. Otherwise, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully requested,

DORITY & MANNING, P.A.



Jason W. Johnston
PTO Registration No. 45,675

Tara E. Agnew
PTO Registration No. 50,589

Attorneys for Applicants

DORITY & MANNING, P.A.
P. O. Box 1449
Greenville, SC 29602-1449
Phone: (864) 271-1592
Facsimile: (864) 233-7342

Date:

10/1/03